

PEITION

To the Commissioner of Patents and Trademarks
Washington, D.C. 20231

Your Petitioners, GARRY W. BUSBOOM and JOHN C. CRUMRINE, citizens of
the United States and residents of the State of Nebraska, whose post office addresses
are R. R. 3, Box 146A, Beatrice, Nebraska 68310, and 2010 Monroe Street, Beatrice,
Nebraska 68310, respectively, pray that Letters Patent may be granted to them for the
improvement in

A LAWN MOWER HAVING FLOW CONTROL
BAFFLES AND REMOVABLE MULCHING BAFFLES

as set forth in the following specification.

Cross-Reference to Related Application

This is a continuation application of application Serial No. 08/784,825 filed
January 17, 1997, entitled LAWN MOWER HAVING FLOW CONTROL BAFFLES AND
REMOVABLE MULCHING BAFFLES, ^{now U.S. Pat. No. 5,345,475} which is a continuation-in-part application of
application Serial No. 08/559,575 filed November 16, 1995, entitled HILLSIDE-STABLE
POWERABLY-MOTIVATED LAWN MOWERS, ^{now abandoned}

Background of the Invention

1. Field of the Invention

This invention relates to a lawn mower having multiple rotary cutting blades and
more particularly to a lawn mower of the type described having a first flow control baffle
positioned at the underside of the mower deck forwardly of the multiple rotary cutting
blades, a second flow control baffle positioned at the underside of the mower deck
rearwardly of the multiple rotary cutting blades, and further including mulching baffles
removably positioned between the first and second flow control baffles which enables
the mower to be easily converted from a side discharge mower to a mulching mower.

1 2. Description of the Related Art

Commercial-type lawn mowers, whether they are walk-behind or riding mowers, normally include a mower deck having multiple rotary cutting blades positioned therein. The mower deck may be classified either as a mulching deck, a side discharge deck, a rear discharge deck or a bagging deck depending upon the manner in which the cut grass cuttings or clippings are handled or directed. When a mower is of the side discharge deck type, the grass clippings are discharged out one side of the deck and onto the ground. If the lawn mower is of the mulching deck type, the grass clippings are re-cut into finer particles and are then discharged directly down to the ground. Oftentimes, a mower is converted from a side discharge mower to a mulching mower and vice versa by changing certain of the deck baffles and the type of blade.

The prior art has previously provided mulching baffles or housings which are attached to the underside of the mower deck around the path of each cutting blade. The mulching baffles maintain the clippings cut by each blade in an enclosed area around the blade so that the clippings are re-cut by the mulching blades and are directed down to the ground. The mulching blades used on such prior art mowers normally have secondary cutting edges spaced inwardly from the primary cutting edges, which re-cut the clippings and direct them downward to the ground. For example, see U.S. Patent No. 5,129,217 wherein a multiblade mower is described which has removably affixed mulching housings secured to the underside of the mower deck top wall and which overlie the associated cutting blade. Another type of prior art lawn mower having mulching capabilities has been marketed by Exmark Mfg. Co., Inc., the assignee of this invention, under the trademark Micro-Mulch. In the prior art lawn mowers known to applicants herein, and as described hereinabove, the lawn mowers

are only able to be converted to a mulching mower and vice versa through the labor-intensive and time-consuming installation of mulching baffles or housings.

In the lawn mower of the co-pending application identified hereinabove, first and second flow control baffles are provided which are positioned forwardly and rearwardly, respectively, of the rotary cutting blades and which serve to efficiently direct the cut grass clippings towards the side discharge of the mower deck. The removable mulching baffles described in this invention are designed to cooperate with the flow control baffles described in the co-pending application.

It is therefore a principal object of the invention to provide an improved multiblade lawn mower.

A further object of the invention is to provide a multiblade, side discharge mower having flow control baffles and removable mulching baffles.

Still another object of the invention is to provide a lawn mower of the type described wherein removable mulching baffles may be quickly and easily attached to the underside of the mower deck.

Still another object of the invention is to provide a lawn mower of the type described including removable mulching baffles which cooperate with flow control baffles to define individual mulching chambers surrounding each of the rotary cutting blades.

Still another object of the invention is to provide a lawn mower of the type described having a flow control baffle which efficiently directs the grass clippings and air towards the side discharge of the mower deck in a manner which prevents the grass clippings and air from being directed downwardly onto the ground or turf unless the mulching baffles are mounted on the mower.

1 Still another object of the invention is to provide removable mulching baffles for a
multiblade lawn mower which is comprised of a minimum number of parts and which
requires a minimum number of connection points.

These and other objects will be apparent to those skilled in the art.

5 Summary of the Invention

A multiblade lawn mower is described comprising a mower deck including a top
wall, a front wall, a back wall and first and second side walls which define a downwardly
directed opening. One of the side walls has a discharge opening formed therein so that
the mower deck discharges grass clippings from one side thereof. The grass clippings
may either be discharged from the discharge opening onto the ground or into some sort
of collection container, bag or hopper. A plurality of cutting blades are rotatably
disposed within the mower deck and are driven by a suitable power means. A first flow
control baffle is positioned in the mower deck which extends downwardly from the
interior surface of the top wall of the mower deck between the cutting blades and the
front wall of the mower deck. The first flow control baffle extends substantially
continuously from a first location adjacent the interior surface of the side wall opposite
the discharge opening to a second location adjacent the interior surface of the side wall
having the discharge opening formed therein. A second flow control baffle is also
positioned in the mower deck which extends downwardly from the interior surface of the
top wall of the mower deck between the cutting blades and the back wall of the mower
deck. The second flow control baffle includes a plurality of semi-circular baffle portions,
each of which are positioned adjacent one of the cutting blades. The first and second
flow control baffles define a plurality of open throat portions which are positioned
between the adjacent cutting blades.

When the mower is used strictly as a side discharge mower, the flow control baffles, and especially the first flow control baffle, efficiently direct the grass clippings and air to the side discharge opening without the grass clippings being deflected downwardly from the walls of the mower deck onto the ground. When it is desired to convert the mower to a mulching mower, a plurality of removable mulcher baffles are secured to the first flow control baffle, the second flow control baffle and the mower deck to close the throat portions, and the discharge opening, whereby the first and second flow control baffles cooperate, with the mulching baffles, to define a substantially cylindrical mulching chamber around each of the cutting blades.

Brief Description of the Drawings

Figure 1 is a front perspective view of a lawn mower having the flow control baffles and removable mulching baffles installed thereon;

Figure 2 is a partial top elevational view of the lawn mower;

Figure 3 is a bottom perspective view of the mower deck having the removable mulching baffles installed thereon; and

Figure 4 is an exploded bottom perspective view of the mower deck of Figure 3.

Description of the Preferred Embodiment

The numeral 10 refers to a multiblade lawn mower upon which the invention herein is mounted. Lawn mower 10 is shown to be a riding lawn mower, but it could also be a walk-behind or pull-type lawn mower. Lawn mower 10 generally includes a frame 12 having a pair of driven wheels 14 and 16 at the rear end thereof and at least one or more caster wheels 18 at the forward end thereof. Lawn mower 10 also includes a conventional power means, such as an internal combustion engine 20, for driving the wheels 14 and 16 and for driving the cutting blades, as will be described

hereinafter. An operator's station 22 is provided on frame 12 to accommodate an operator. The conventional controls 24 are also provided.

Mower deck 26 is mounted on the forward end of frame 12 and, in the embodiment shown in the drawings, "floats" with respect to frame 12 in a generally conventional fashion. Mower deck 26 includes a top wall 28, a front wall 30 extending downwardly from the forward end of top wall 28, a left side wall 32 extending downwardly from the left side of the top wall 28, a right side wall 34 extending downwardly from the right side of top wall 28, and back wall 36 extending downwardly from the rearward end of top wall 28. In the embodiment shown in the drawings, right side wall 34 is provided with a discharge opening, generally referred to by the reference numeral 38, which may take any conventional shape. It should also be noted that discharge opening 38 could be provided in left side wall 32 if required or desired. Thus, mower deck 26 is a side discharge mower deck which will normally discharge the grass cuttings or clippings therefrom, for deposit on the ground, at the right side of the lawn mower or into some sort of collection container, bag, etc.

Figures 3 and 4 are bottom views of the mower deck and it can be seen therefrom that a first flow control baffle 40, constructed of a suitable metal material, is positioned between the interior surface of front wall 30 and the rotary cutting blades 42, 44 and 46 which are rotatably supported by conventional spindles or the like on top wall 28 and which are suitably driven, through a belt mechanism, or other suitable drive mechanism, by the engine of the lawn mower.

Flow control baffle 40 has one end positioned or located adjacent the interior surface of left side wall 32 at 48 and has its other end positioned or located adjacent the interior surface of right side wall 34 at 50 which is adjacent the forward end of discharge opening 38. Preferably, baffle 40 is secured to the underside of top wall 28

1 by welding. However, baffle 40 could be secured to top wall 28 by bolts or the like. For
purposes of description, assuming that three cutting blades are utilized, baffle 40
includes a first arcuate baffle portion 56 which partially extends around the blade tip
path of cutting blade 42, a first relatively straight baffle portion 58, a second arcuate
5 baffle portion 60 which partially extends around the blade tip path of cutting blade 44, a
second relatively straight baffle portion 62, a third arcuate baffle portion 64 which
partially extends around the blade tip path of cutting blade 46, and a third relatively
straight baffle portion 66.

10 As seen in Figures 3 and 4, a second flow control baffle 68 is also provided in
mower deck 26 and is positioned rearwardly of cutting blades 42, 44 and 46 and
extends downwardly from the underside of top wall 28. Baffle 68 may be either welded
to or bolted to the top wall 28 as desired. Baffle 68 is comprised of semi-circular baffle
portions 70, 72 and 74, as seen in Figure 4. As seen in Figure 4, the rear corners of
15 deck 26 are rounded and form continuations of the baffle portions 70 and 74. The rear
corners of the deck are referred to by the reference numerals 82 and 83, respectively.
If the rear corners of the corners of the deck 26 are substantially square, i.e., not
rounded, it is preferred that the outer ends of baffle portions 70 and 74 be extended, in
a semi-circular fashion, to the interior surfaces of walls 32 and 34, respectively. For
purposes of description, the flow control baffles 40 and 68 define cutting chambers 76,
78 and 80, respectively. It should also be understood that, in some cases, back wall 36
20 may be eliminated with the flow control baffle 68 forming the back wall of the mower
deck.

25 As cutting blades 42, 44 and 46 are rotated by the engine on the lawn mower,
the grass cuttings created by cutting blade 42 are deflected upwardly and outwardly
and strike either the interior surface of baffle portion 70, the interior surface of corner

1 82, the interior surface of baffle portion 56 and/or the interior surface of baffle portion 58
with those surfaces further deflecting the cuttings upwardly into the area above the
outer ends of cutting blade 42 for discharge through throat portion 84, located between
cutting chambers 76 and 78. Baffle portion 58 deflects the cuttings inwardly into the
5 path of cutting blade 44, but thereabove for the most part.

Cutting blade 44 performs similarly in cutting chamber 78 with the baffle portions
72, 60 and 62 causing the cuttings to be deflected upwardly, as in chamber portion 76,
and to be discharged through the throat portion 86, located between cutting chambers
78 and 80. Baffle portion 62 deflects the cuttings inwardly into the path of cutting blade
10 46, but thereabove for the most part.

Cutting blade 46 performs similarly in cutting chamber 80 with the baffle portions
74, 64, 66 and the interior surface of corner 83 causing the cuttings to be deflected
upwardly and along the interior surface of baffle portion 66 and to be discharged
through discharge opening 38. As seen, throat portion 86 is larger than throat portion
15 84 due in part to the larger volume of cuttings necessarily being passed through throat
portion 86.

Figures 3 and 4 illustrate the removable mulching baffles of this invention which
are referenced by the numerals 90 and 92, respectively. Baffle 90 is generally Y-
shaped and includes a base portion 94 and arcuate legs 96 and 98. Base portion 94 is
provided with an opening 100 formed therein adjacent the end thereof. Legs 96 and 98
are provided with openings 102 and 104 formed therein, respectively. Openings 100,
102 and 104 are adapted to receive bolts 106, 108 and 110, respectively. Bracket 111
is secured to baffle portion 72 and has an opening formed therein adapted to receive
20 bolt 106 to fix base portion 94 to baffle portion 72. Flow control baffle 40 has an
opening 114 adjacent the juncture of baffle portions 56 and 58 which is adapted to

1 receive bolt 108 to fix leg 96 to flow baffle 40 to close throat portion 84 to create a
mulching chamber surrounding cutting blade 42. One end of baffle portion 60 has an
opening 116 formed therein which receives the bolt 110 to fix leg 98 to flow control
baffle 40.

5 Baffle 92 is also generally Y-shaped and includes a base portion 118 and legs
120 and 122. Baffle 92 has openings 124 and 126 formed therein adjacent the ends of
base portion 118 and leg 120, respectively, which are adapted to receive bolts 130 and
132, respectively. The numeral 140 refers to a "blocking" member which is preferably
provided at the end of leg 122, as seen in Figure 4. Member 140 has a bracket 141
affixed thereto which is adapted to be bolted to top wall 28.

10 Mulching baffle 92 is mounted to the underside of the mower deck as follows.
Baffle 92 is positioned as illustrated in Figure 3. Bolt 130 is inserted through opening
124 in leg 118 and an opening formed in bracket 146 which is secured to the end of
baffle portion 74. Bolt 132 is inserted through opening 126 in leg 120 and through an
opening 148 provided in flow control baffle 40 adjacent the juncture of baffle portions 60
and 62. Bolt 143 is extended through opening 144 in member 140 and through the
opening 145. When so installed, baffle 92 closes throat portion 86 and discharge
opening 38 to create a mulching chamber surrounding cutting blade 46. It is also
15 preferred that discharge opening 38 be completely closed by means of plate 150 which
is bolted to mower deck 26 by suitable bolts. One end of member 140 is bolted to plate
150 by bolt 143 extending through opening 144 formed in member 140 and through
opening 145 formed in plate 150. The closing of the throat portions 84 and 86 also
creates a mulching chamber surrounding cutting blade 44. The forward end of member
140, by being positioned adjacent baffle 40, blocks grass cuttings, which may be
between legs 120, 122 and baffle 40, from passing towards the interior surface of side

1 wall 34, where the cuttings would normally be deposited on the turf in an undesirable
fashion. The forward end of member 140 directs those cuttings into the cutting path of
cutting blade 46 rather than to the area to the side of the path of the cutting blade 46.
The mulching baffles 90 and 92 are quickly and easily installed on the mower deck to
5 convert the side discharge mower deck into a mulching deck with a minimum amount of
material being required. The baffles 90 and 92 are also quickly and easily removable
from the mower deck to return the mower to its side discharge mode when desired.

Thus it can be seen that the invention accomplishes at least all of its stated
objectives.